

SESSION: Economics of changes

# Economic consequences of choosing the energy scenarios

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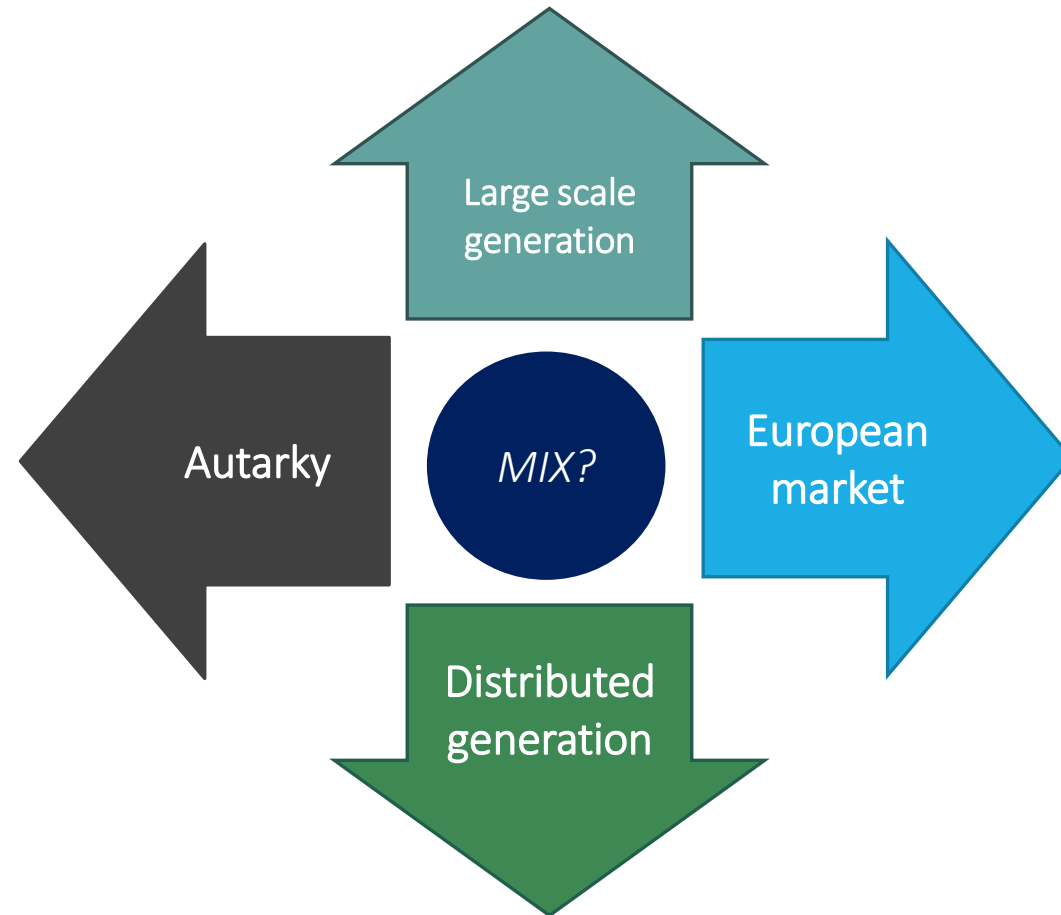
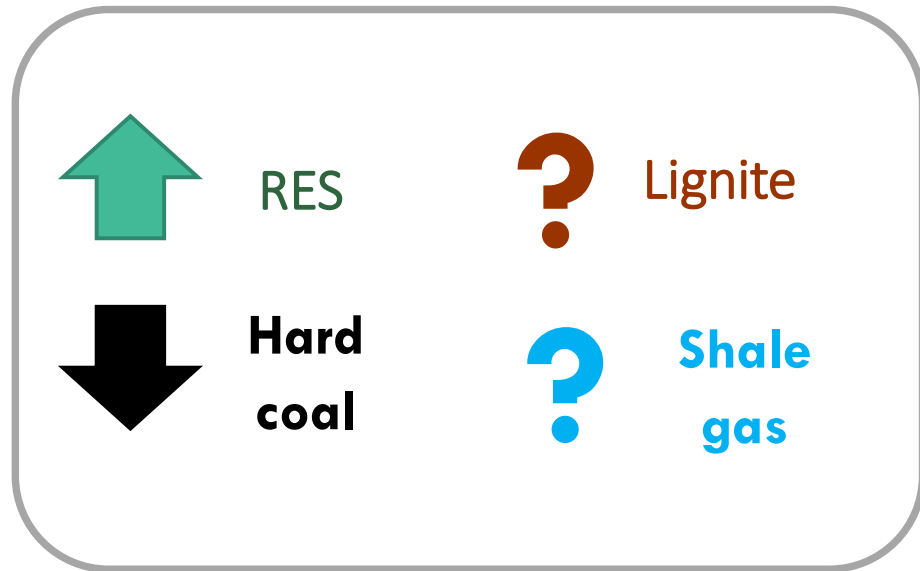
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# POLISH ENERGY DILEMMAS

*Domestic resource potential*



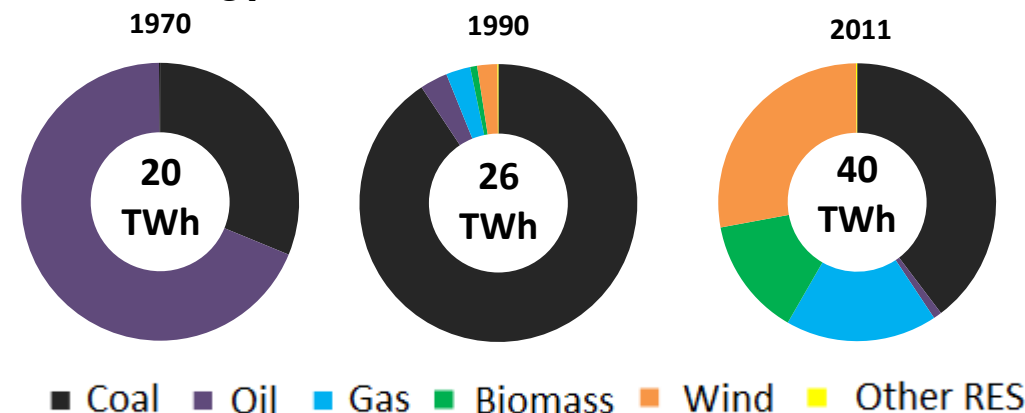
*Energy sector development framework*

## IS DEEP TRANSFORMATION OF POLISH ENERGY SECTOR POSSIBLE?

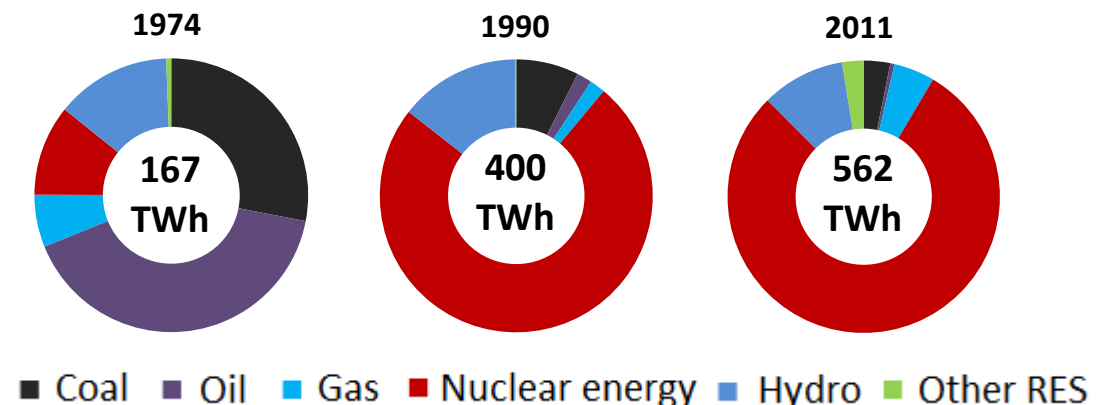
European experience suggests that energy transformation is possible within a few decades.

Favorable factors – resource stress, new technologies, growing demand for energy.

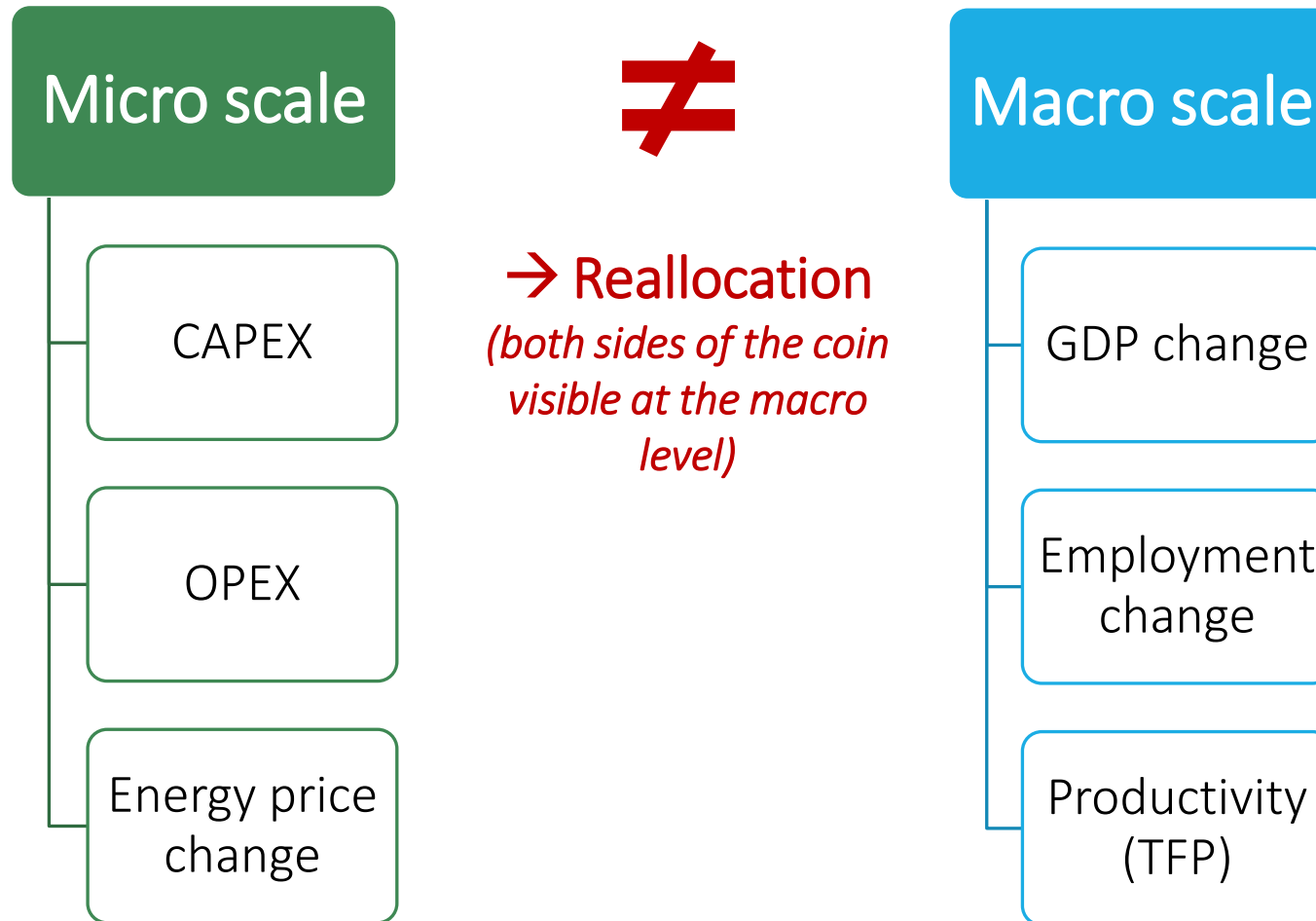
### Energy mix in Denmark, 1970-2011



### Energy mix in France, 1974-2011



## ECONOMIC IMPACTS: MICRO VS MACRO



## THE RESULTS OF ANALYSIS BY WISE POLISH ENERGY MIX 2050

Projection assuming that **current domestic policies will be realized.**

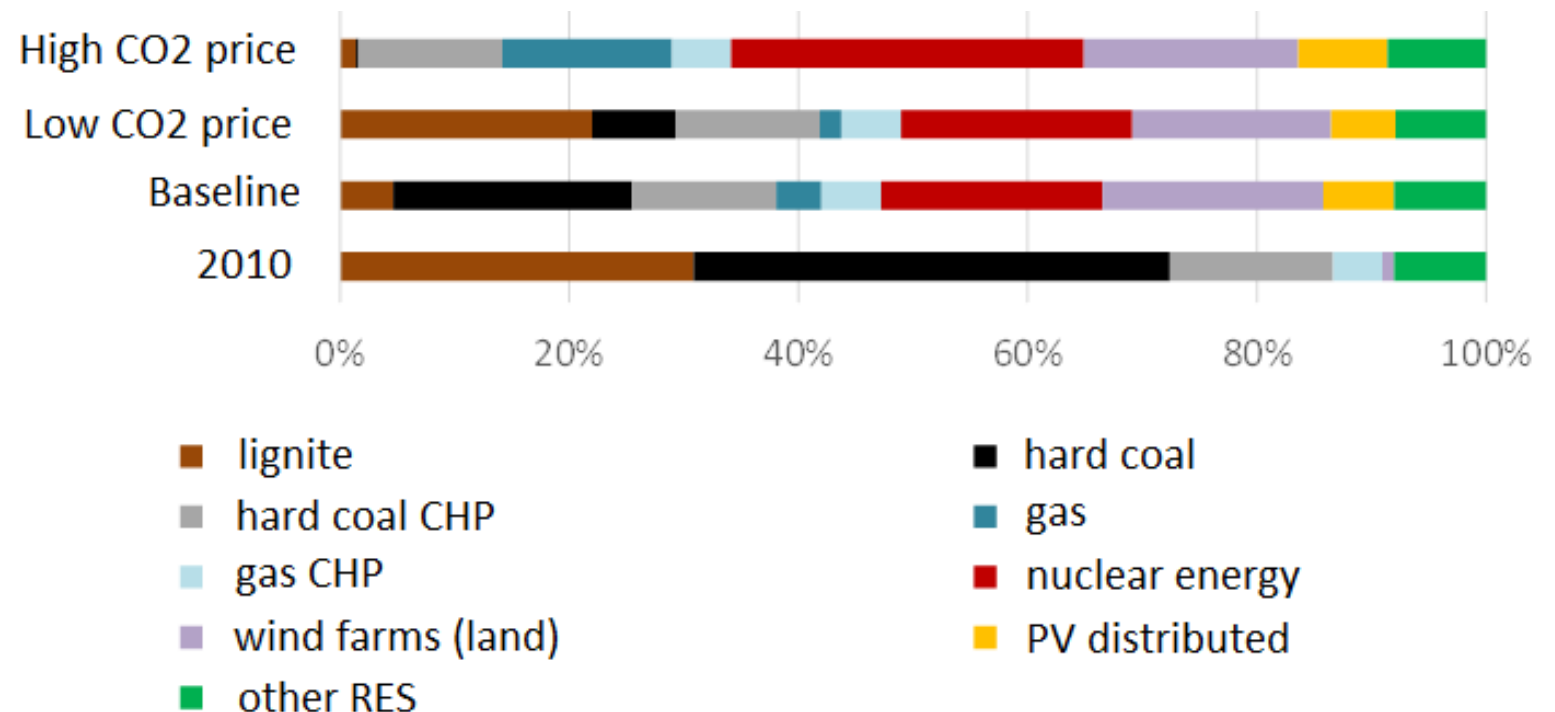
Three options for the CO2 allowances prices in 2050:

approx. 25 EUR (low)

50 EUR (baseline)

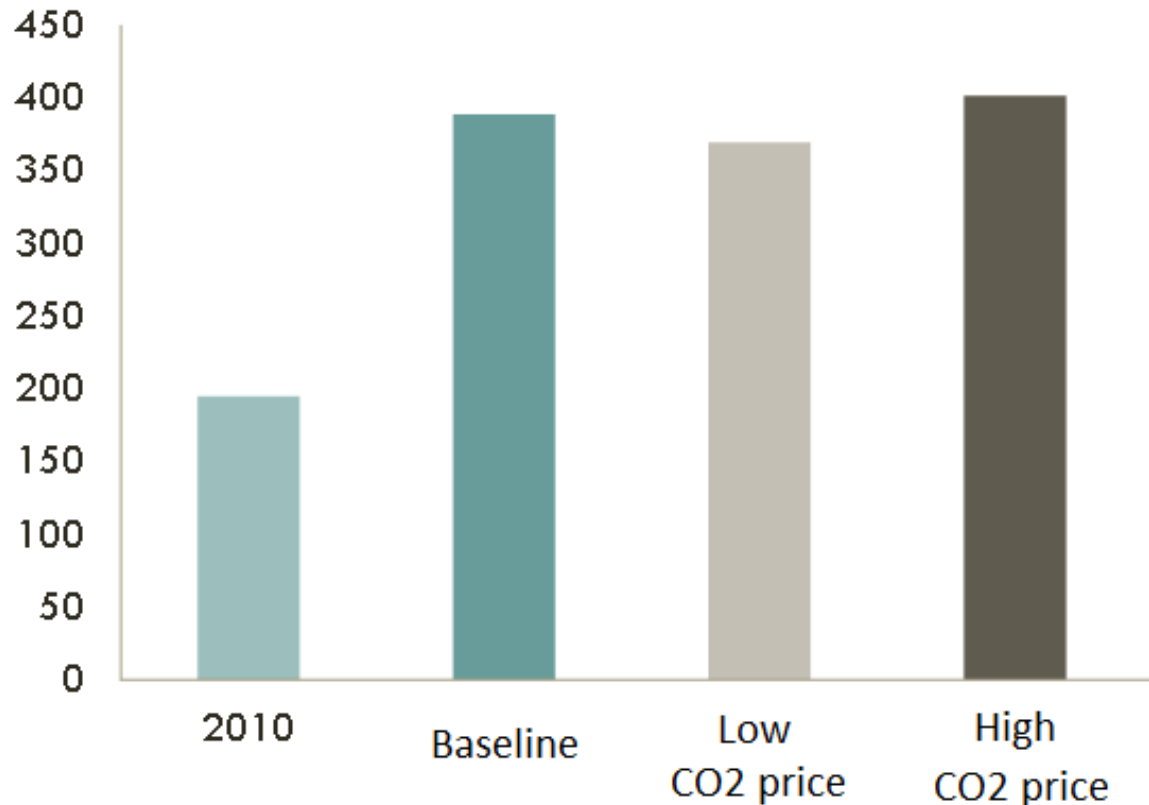
80 EUR (high)

### Energy mix projection – 2050



## THE RESULTS OF ANALYSIS BY WISE POLISH ENERGY MIX 2050

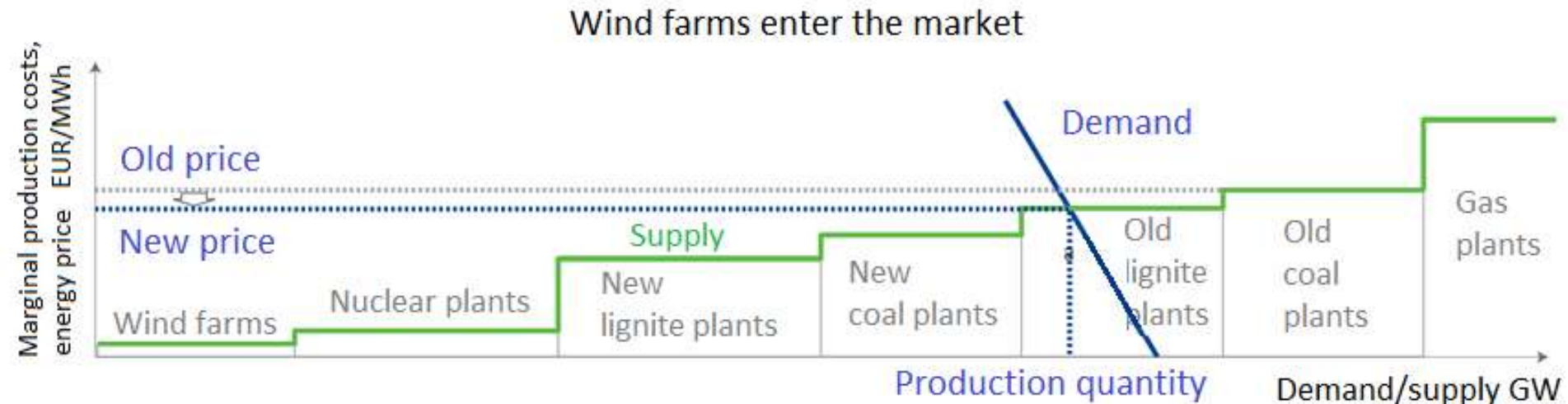
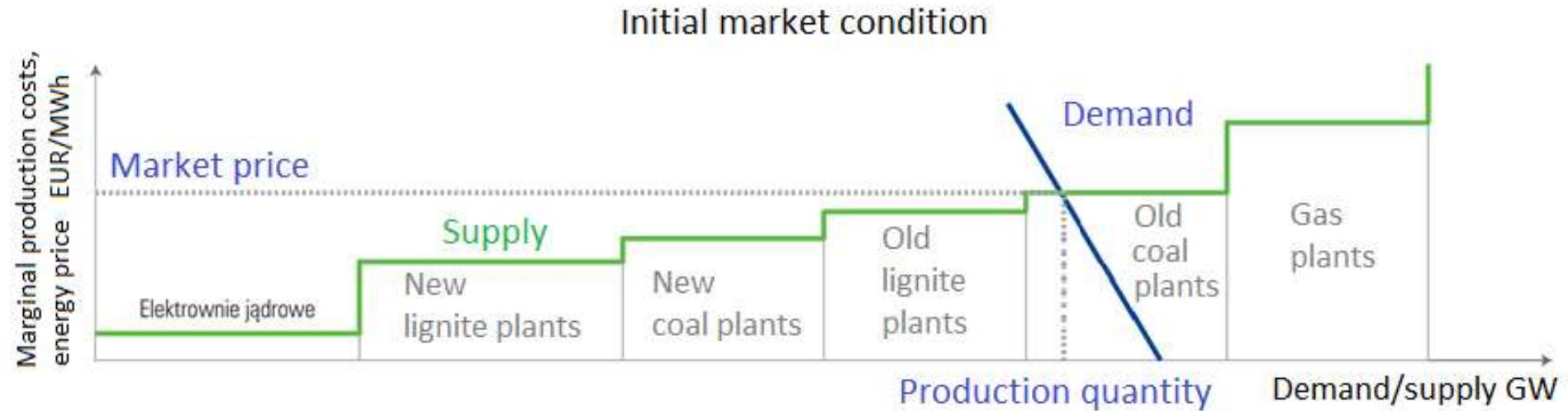
### Wholesale electricity prices



Source: WISE Poessia model

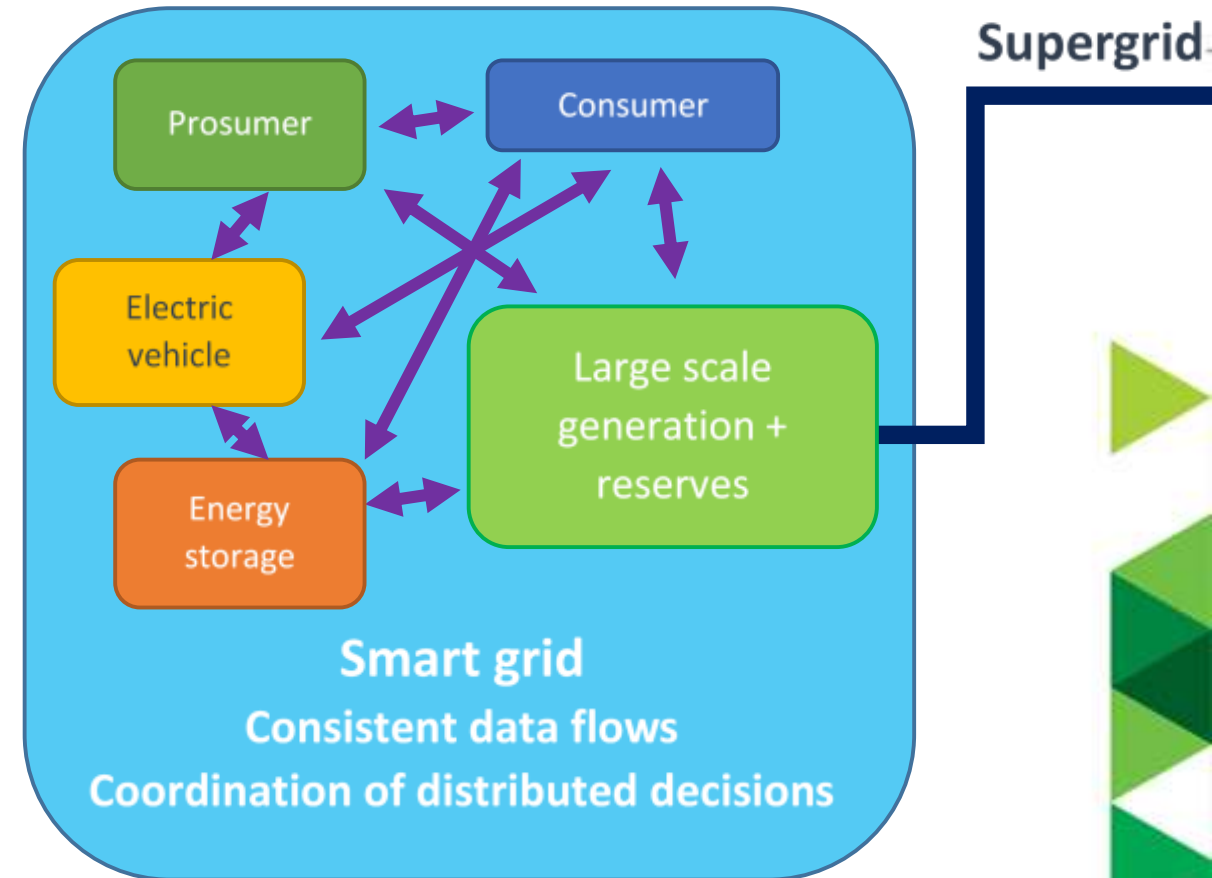
- **Doubling** of the wholesale electricity prices until 2050, key driver – **infrastructure modernisation**
- Growing RES + nuclear program → limited impact of allowance price on the electricity price (<10%)
- **Imports and CCS not included in the analysis**

## SHORT/MID-TERM: *RES ON THE ENERGY MARKET*



## MID/LONG-TERM NEW ENERGY MARKET FOUNDATIONS?

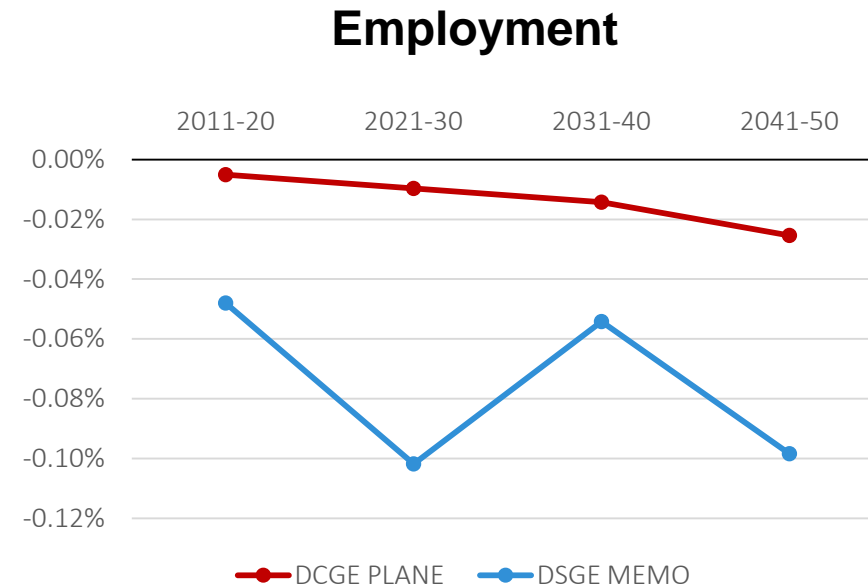
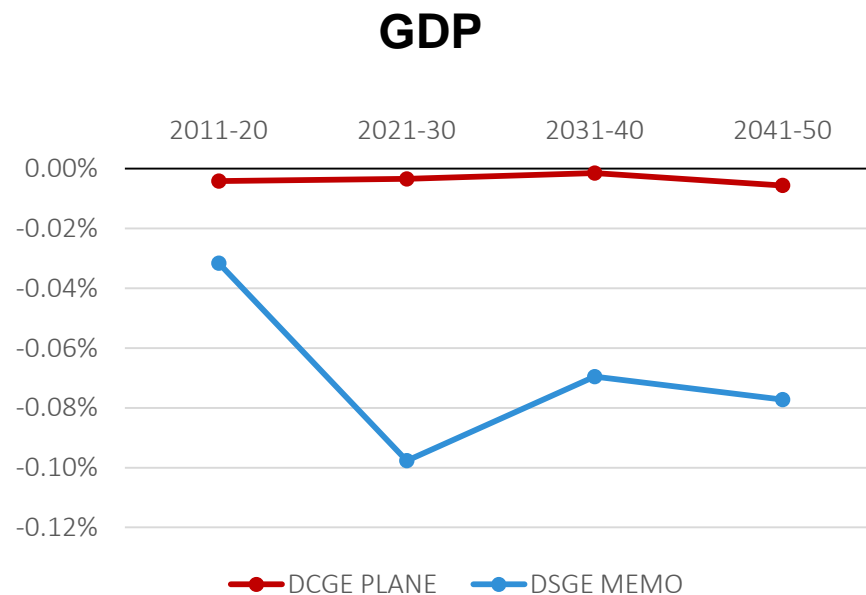
- New technologies → possible departure from the centralised energy system
- Potentially huge impact on the **competition** and market structure
- Distributed generation **is not necessarily prosumer-driven** – central administrator of distributed infrastructure model is possible
- What role and operating model for the large, system power plants?





## ENERGY SECTOR FROM THE MACRO PERSPECTIVE

### Energy sector transformation impact on GDP and employment The results from two macroeconomic models



Source: WISE Institute calculations

Result **depend on projected fossil fuel prices** (higher prices → nuclear and RES more beneficial).

Different **macroeconomic models** → different results (different impact of sectoral shocks on the economy)

Regardless of projected prices and model type – **limited** impact of energy mix changes on macro aggregates

# CONCLUSIONS

- **Multiple possible scenarios** for Polish energy sector– **not always evident**
  - Key cost – **infrastructure modernisation**
  - Aggregated costs **similar** for different scenarios
  - Macroeconomic impacts of energy sector transformation are **limited**
- BUT, IN PRACTICE IT IS IMPORTANT:**
- who will deliver the technologies
  - whether the market will be competitive
  - how to raise capital for investments
- challenges for the domestic **(industry,) energy and climate policy**

# THANK YOU FOR ATTENTION



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